

Claims

What is claimed is:

1. A process for transitioning from a first polymerization reaction conducted in the presence of a first catalyst, to a second polymerization reaction conducted in the presence of a second catalyst wherein the first and second catalysts are incompatible, the process comprising:

- (a) discontinuing the introduction of the first catalyst into a reactor wherein the first catalyst comprises a Ziegler-Natta catalyst;
- (b) introducing and dispersing in the reactor an effective amount of a non-volatile adsorbent to deactivate the first catalyst and substantially halt the first polymerization reaction; and
- (c) introducing and dispersing in the reactor the second catalyst wherein the second catalyst comprises a MAO-based, single-site catalyst.

2. The process of claim 1 wherein the first polymerization reaction and the second polymerization reaction comprise a gas phase process.

3. The process of claim 1 wherein the first polymerization reaction and the second polymerization reaction are conducted in a fluidized bed reactor.

4. The process of claim 1 wherein the process is continuous.

5. The process of claim 1 wherein the Ziegler-Natta catalyst comprises a titanium-triethylaluminum catalyst.

6. The process of claim 1 wherein the MAO-based, single-site catalyst comprises a metallocene catalyst.

7. The process of claim 1 wherein the non-volatile adsorbent is selected from the group consisting of a solid polymer and compounds that are a non-volatile liquid under the conditions in the reactor.

8. The process of claim 7 wherein the non-volatile adsorbent is a solid polymer and comprises at least one functional group capable of effectively deactivating the first catalyst.

9. The process of claim 7 wherein the non-volatile adsorbent is a solid polymer and comprises at least one functional group capable of reacting with an aluminum alkyl.

10. The process of claim 7 wherein the non-volatile adsorbent is a solid polymer and comprises a long chain copolymer and a substituted alkene.

11. The process of claim 7 wherein the non-volatile adsorbent comprises a long chain co-or ter-polymer of ethylene and one or more co-monomers selected from the group consisting of acrylates, vinyl esters, olefinic anhydrides, olefinic carboxylic esters, olefinic carboxylic acids, olefinic ethers, olefinic amines, olefinic alcohols, olefinic amides, olefinic imines, and olefinic thiols.

12. The process of claim 7 wherein the non-volatile adsorbent comprises one or more long chain polymers selected from the group consisting of poly(ethylene-co-vinyl acetate), poly(ethylene-co-methyl acrylate), poly(ethylene-co-acrylic acid), poly(ethylene-co-methacrylic acid), poly(ethylene-co-ethyl acrylate-co-maleic anhydride), poly(ethylene-co-butyl acrylate-co-maleic anhydride), poly(ethylene oxide) and poly(ethylene imine).

13. The Process of claim 12 wherein the non-volatile adsorbent comprises one or more long chain polymers selected from the group consisting of poly(ethylene-co-acrylic acid), poly(ethylene-co-ethyl acrylate-co-maleic anhydride), poly(ethylene-co-butyl acrylate-co-maleic anhydride) and poly(ethylene-co-vinyl acetate).

14. The process of claim 12 wherein the non-volatile adsorbent comprises one or more long chain polymers selected from the group consisting of poly(ethylene-co-acrylic acid), poly(ethylene-co-ethyl acrylate-co-maleic anhydride), poly(ethylene-co-butyl acrylate-co-maleic anhydride) and poly(ethylene-co-vinyl acetate).

15. The process of claim 7 wherein the non-volatile liquid under the conditions in the reactor comprises a compound selected from the group consisting of alkoxyated amines, alkoxyated amides, carboxylic acids, thiols, and alcohols.

16. The process of claim 14 wherein the non-volatile liquid under the conditions in the reactor comprises a long-chain diethanolamine.

17. The process of claim 15 wherein the non-volatile liquid under the conditions in the reactor comprises N-octadecyl-diethanolamine.

18. The process of claim 15 wherein the non-volatile liquid under the conditions in the reactor comprises N-hexadecyl-diethanolamine.